

REMARKS

The Office Action of May 22, 2008 and the Advisory Action of October 30, 2008 have been received and carefully reviewed. Claims 1-2 and 4-6 were pending prior to the instant amendment. By this amendment, claim 7 is added. Consequently, claims 1-2 and 4-7 are currently pending in the instant application. Reconsideration and withdrawal of the currently pending rejections are requested for the reasons advanced in detail below.

Claims 1, 2, 4, and 5 were rejected under 35 U.S.C. §103(a) as obvious over Uchida *et al.* (U.S. Patent No. 6,468,365, hereinafter, “Uchida”). Uchida, however, fails to render the claimed invention unpatentable. Each of the claims recite a specific combination of features that distinguishes the invention from the prior art in different ways. For example, independent claim 1 recites a combination that includes, among other things:

“27.0 mass% to 32.0 mass% of R, which is at least one of Nd, Pr, Dy and Tb and which always includes either Nd or Pr . . . 63.0 mass% to 72.5 mass% of T, which always includes Fe and up to 50% of which is replaceable with Co . . . 0.01 mass% to 0.08 mass% of Ga . . . 0.85 mass% to 0.96 mass % of B . . . wherein the magnet comprises a main phase with a tetragonal R_{1.1}Fe₄B₄ type crystal structure, which accounts for at least 90% of the overall volume of the magnet, but includes substantially no R_{1.1}Fe₄B₄ phases.”

Independent claim 5 recites yet another combination that includes, *inter alia*,

“preparing a powder composition comprising 27.0 mass% to 32.0 mass% of R (which is at least one of Nd, Pr, Dy and Tb and which always includes either Nd or Pr), 63.0 mass% to 72.5 mass% of T (which always includes Fe and up to 50% of which is replaceable with Co), 0.01 mass% to 0.08 mass% of Ga and 0.85 mass% to 0.96 mass % of B of an alloy . . . compacting and sintering the alloy powder, thereby making a sintered magnet . . . subjecting the sintered magnet to a single heat treatment at a temperature of 400°C to 600°C.”

At the very least, Uchida, whether taken alone or in combination, fail to disclose or suggest any of these exemplary features recited in independent claims 1 and 5.

In the Advisory Action, the Examiner states “*Uchida ‘365 specific examples, cited in the rejection, contain 0.97 wt% boron which closely approximates the instantly claimed upper limit of 0.96 wt% boron one of ordinary skill in the art would have expected the specific examples of R-T-B sintered magnets taught by Uchida ‘365 to have the same properties . . . The data in applicant’s Figure 1 indicates that there is little difference in the magnetic properties between a Ga containing alloy containing 0.96% B as recited in the instant claims and a Ga containing alloy containing 0.97% B as exemplified in Uchida ‘365.*” Thus, the Examiner readily acknowledges that there is no point of overlap in Uchida’s mass% boron range within the mass% boron as claimed.

Applicant is also aware of the M.P.E.P. § 2144.05 I, wherein “*a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of American v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).*” However, the M.P.E.P. § 2144.05 B. III. provides that “*Applicant’s can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.’ In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).*”

The aforementioned point of criticality has previously been addressed, for example, in Applicant’s response filed September 22, 2008, at least, at pages 3-5. In reiteration, Applicant’s stated the following:

“*On page 3 of the FINAL Office Action, the Examiner states that “[e]ach of Uchida ‘365’s examples cited by the Examiner contains 0.97 wt% boron whereas the instant claims recite an upper boron content of 0.96 wt%. Thus, the instantly*

claimed boron content and the exemplified boron content taught by Uchida '365 closely approximate each other." On page 4, the Examiner acknowledges that the claims and Uchida differ in that Uchida does not teach the exact same proportions as recited in the instant claims and that Uchida is silent with respect to the relative proportions of the $R_2T_{14}B$ and $R_{1.1}Fe_4B_4$ phases as recited in claim 1. On page 5, the Examiner further concludes "*because Uchida '365's specific examples . . . contain 0.97 wt% gallium which closely approximates the instantly claimed upper limit of 0.96 wt% gallium, one of ordinary skill in the art would have expected the specific examples of R-T-B sintered magnets taught by Uchida '365 to have the same properties.*" However, Applicant contends that the claimed ranges recited in the present invention yield unexpected results otherwise not realized by those of ordinary skill in the art.

The upper limit of boron (B) concentration recited in the claims is less than the boron concentration of the examples disclosed in Uchida. As described in Applicants originally filed specification, the range of boron concentration in the R-T-B base sintered magnet is particularly relevant to the disclosed invention. For example, as the B concentration is lowered, a soft magnetic R_2Fe_{17} phase would be easily formed in the grain boundary phase, and therefore, the coercivity would decrease significantly. FIG.1, of the present application, shows that the intrinsic coercivity H_{cJ} of the sample including 0.96 % boron and 0.02 mass % of Ga, which was heated at 773 K, is drastically increased as compared with that of the sample as-sintered. In addition, FIG.1 shows that the intrinsic coercivity H_{cJ} of the sample including 0.96 % boron and no Ga is much less than that of the sample including 0.96 % boron and 0.02 mass % Ga. The addition of a small amount of Ga can increase the intrinsic coercivity H_{cJ} of the R-T-B base sintered magnet that includes 0.96 96 boron or less.

Turning again to FIG.1, when the boron concentration exceeds 0.96 %, a difference in the intrinsic coercivity H_{cJ} between the sample including Ga and the sample including no Ga is very small. In contrast, a difference in the intrinsic

coercivity H_{cJ} between the sample including Ga and the sample including no Ga becomes large when the boron concentration is less than 0.96 %. In view of the effects of the addition of Ga, Applicant has determined that a critical point exists between 0.96 % and 0.97 % in boron concentrations of the R-T-B base sintered magnet.

The above effects of the addition of Ga into the R-T-B base sintered magnet in which the boron concentration is less than 0.96 % is **not** (emphasis added) obvious from the cited prior art, and the effects constitute, *inter alia*, otherwise unexpected results which is fully supported by the disclosure of the present application.”

Additionally, the M.P.E.P. § 2144.05 B. III. states that “Applicant can rebut a presumption of obviousness based on a claimed invention that falls within a prior art range by showing “(1) [t]hat the prior art taught away from the claimed invention . . . or (2) that there are new and unexpected results relative to the prior art.” *Iron Grip Barbell Col., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPZ2d 1225, 1228 (Fed. Cir. 2004).” Applicant notes, in particular, the Examiner’s comments in the last paragraph of the Advisory Action of October 30, 2008. Specifically, the Examiner stated that “*Figure 1 indicates that the heat treated Ga containing alloy containing 0.97% B as taught by Uchida ‘365 has better intrinsic coercivity than the applicants’ heat treated Ga containing alloy containing 0.96% B, see the intrinsic coercivity for the as sintered embodiment and the heat treated at 773K embodiment.*” However, it is noted, for example, at paragraph [0049] of the present U.S. Patent Application Publication No. US 2005/0268989 A1, “*if the B content were greater than 0.96 mass %, then a B-rich phase would increase too much to achieve high remanence . . . A more preferable B concentration range is from 0.90 mass % through 0.96 mass %. Thus, since the B concentration is reduced according to the present invention, the B-rich phase (i.e., $R_{1.1}Fe_4B_4$) can be substantially eliminated from the constituent phases of the sintered*

magnet and the volume percentage of the main phase can be increased. As a result, the remanence of the sintered magnet can be increased without decreasing the coercivity.”

Thus, the claimed range of the present invention, again, provides new and unexpected results relative to the prior art. Furthermore, Uchida teaches **away** from the invention as claimed, since it is evident, and readily acknowledged by the Examiner, that the mass wt% of B of Uchida is outside the claimed range of the present invention thereby rendering a sintered magnet which is structurally different from the magnet as claimed.

Claim 5, of the present invention, has been amended to recite, *inter alia*, subjecting the sintered magnet to a single heat treatment at a temperature of 400°C to 600°C. On page 6, of the FINAL Office Action, the Examiner acknowledges that Uchida discloses a second heat treatment at 500° C encompassed by a post sintering heat treatment step at 450° C-600° C. Accordingly, it is evident that the presently claimed invention is distinguished from the prior art in that it only requires a single heat treating step, whereas Uchida requires a second heat treatment application.

In accordance with the M.P.E.P. § 2143.03, to establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 409 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 196 (CCPA 1970). Therefore, it is respectfully submitted that Uchida, taken alone or in any proper combination, fails to disclose or suggest the subject matter as recited in claims 1 and 5. Hence, withdrawal of the rejection is respectfully requested.

Each of the dependent claims depend from one of independent claims 1 or 5 and are patentable over the cited prior art for at least the same reasons as set forth above with respect to claims 1 and 5.

In addition, each of the dependent claims also recites combinations that are separately patentable.

In view of the foregoing remarks, this claimed invention, as amended, is not rendered obvious in view of the prior art references cited against this application. Applicant therefore requests the entry of this response, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

In discussing the specification, claims, and drawings in this response, it is to be understood that Applicant in no way intends to limit the scope of the claims to any exemplary embodiments described in the specification and/or shown in the drawings. Rather, Applicant is entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 19-2380. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Should the Examiner believe that a telephone conference would expedite issuance of the application, the Examiner is respectfully invited to telephone the undersigned patent agent at (202) 585-8316.

Respectfully submitted,

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